Amendments to the Specification

Please make the following amendments to the Specification:

Page 1, lines 8-11

Two commonly assigned patent applications in the name Mark Taunton, ~~filed on the same date as the present application,~~ each also entitled "Multi-tone transmission", and with ~~reference numbers~~ ~~BP1756~~ Application Nos. 09/921,756, filed August 6, 2001 and ~~BP1757~~ 09/921,757, filed August 6, 2001, are incorporated herein by reference.

Page 15, lines 21-31

In the specific embodiment, the ~~step~~ preprocessing stage 14 following the introduction of regenerated intermediate data 18 is a scrambling ~~step~~ stage. Such a ~~step~~ preprocessing stage has a particularly strong effect: any single bit change (0 to 1 or 1 to 0) in the payload of the ATM cell stream will have a permanent effect on the subsequent output from the payload scrambler (after an initial period while data bits percolate through its internal memory), since that process has local feedback and retains a memory of the effect of all bits which have passed through. ~~The~~ A second scrambling ~~step~~ stage, applied to the full data stream (including ATM cell headers and other overhead data), similarly causes all later data output values (beyond an initial short sequence) to be affected as a result of changing a single input bit.

Page 18, lines 9-11

In the analogue front end, digital to analogue conversion 148 is performed following which the stream is passed to a line driver ~~to drive~~ 152 to drive the telephone line 154.

Page 18, lines 12-16

Note that each functional block shown in the Figure 2 within the Data Path modules 100 and 124, the Modulator module 126 and the Regenerator Control module 127, could in principle be implemented either by hardware of by software, or by some combination of the two. The AFE 146 module normally uses hardware blocks for its functions.

Page 23, line 29 to page 24, line 10

This observation provides another method of changing the data stream, for symbols where it is desired to re-generate because of a peak above the specified threshold in the encoded time-domain version of the symbol. What can be done is to check whether any bite of data carried by the symbol is part of the payload of an idle cell, and if so, to make a modification in that byte. Because the payload of idle cells is ignored by the receiver 200, any bit of the 8 in the byte can be modified, allowing up to 255 possible modifications (relative to the original value) to be tried out--this is far more than enough! In general, to achieve maximum effect, the earliest available idle-cell payload byte in the data for the symbol should be so modified, since all modifications

affect (by spreading) only the encoded form of alter bytes in the stream (and hence, that portion of the stream which is carried in the rest of the symbol).

Page 24, line 23 to page 25, line 25

One proviso to this method is that one way of checking the error rate on an ADSL link, sometimes employed for purposes of link maintenance and management, is for the receiving modem 200 to examine the payload bytes of idle cells before it discards them, comparing each byte against the fixed value it is defined to hold in any idle cell. Any errors found in the comparison are assumed to have arisen as a result of uncorrected errors in transmission of the data stream over the ADSL link. Some modems keep count of the error rate on this basis (measured as a moving average of the number of bits in idle cells which are found to be incorrect, divided by the total number of bits in the idle cells seen, over some measurement interval). In such cases, the deliberate introduction of changes to idle cell payload bytes will give rise to an incorrect assessment of the true error rate by the receiving modem 200. In the worst case this may trigger an attempt to re-configure or re-initiate the link, so as to maintain the apparent error rate below the required maximum level.